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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,652	06/23/2003	Seishi Hanaoka	NITT.0141	6143

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EXAMINER

GESESSE, TILAHUN

ART UNIT PAPER NUMBER

2684

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/600,652

Applicant(s)

HANAOKA ET AL.

Examiner

Tilahun B. Gesesse

Art Unit

2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/23/03 & 7/9/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-4, 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Abeta et al (US 6,647,003) "**Abeta**".

3. Claim 1, **Abeta teaches** a method for channel estimation at a receiving apparatus in a mobile communication system uses to obtain a channel estimation result for use in the detection of a data signal received from a transmitting apparatus, (column

8, line 21-column 9, line 14 and figures 4-5), in which obtain the channel estimate result being calculated (see column 7, line 38-column 8, lines 19 and figure 3).

Abeta teaches receiving apparatus receives a data signal containing a plurality of data symbols from the transmitting apparatus (610 of figure 6 and column 3, lines 36-45), estimates a data signal channel condition for each data symbol of the received data signal, (see column 7, line 38-column 8, lines 19 and figure 3, column 8, line 21-column 9, line 14 and figures 4-5).

Abeta teaches detects the received data signal for each of the data symbol in accordance with the estimation result (see column 7, line 38-column 8, lines 19 and figure 3 and abstract).

Claim 2, **Abeta teaches** the receiving apparatus receives a pilot signal form the transmitting apparatus and uses said pilot signal to estimate the channel (column 8, line 21-column 9, line 14 and figures 4-5).

Claim 3, **Abeta teaches** the receiving apparatus estimates the amplitude variation with a propagation for the received data signal in accordance with the pilot signal (column 2, lines 14-26).

Claim 4, **Abeta teaches** the channel is estimated using the symbols of one or more pilot signals containing a symbol that is closest in reception timing to a data symbol of said data signal to be detected (see column 7, line 50-column 8, line 15).

Claim 11. **Abeta teaches** a receiving apparatus in a mobile system (see figures 6-7, CDMA transceiver and 620 receiver), comprising:

Abeta teaches communication a channel estimator for estimating the channel variation between a transmitting apparatus and the receiving apparatus in accordance with a received signal (figures 2-5).

Abeta teaches a detector (400 of figure 4) for detecting the received signal in accordance with an estimation result produced by said channel estimator (see figures 4-5, column 2, lines 39-column 3 line 13, column 8, lines 21-column 9, line 13).

Abeta teaches a demodulator (420 of figure 4) for demodulating the detected received signal, wherein said received data signal includes a plurality of data symbols; (see figure 4) wherein said channel estimator operates at a data symbol rate of said received data signal to perform channel estimation for each data symbol; and wherein said detector detects said received data signal for each of said data symbol column 2, lines 39-column 3 line 13, column 8, lines 21-column 9, line 13).

Claim 12, **Abeta teaches** the channel estimator estimates the channel variation using a pilot signal received from said transmitting apparatus column 2, lines 39-column 3 line 13, column 8, lines 21-column 9, line 13).

Claim 13. **Abeta teaches** the channel estimator estimates the amplitude variation or phase rotation with a propagation for said received signal in accordance with said pilot signal (column 2, lines 14-26).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8-10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abeta in view of Dent (US 6,507,602).

Claim 8. Abeta does not teach the symbol rate of the pilot signal is equal to the symbol rate of said received data signal. However, Dent teaches paging channel equal to traffic channel, as shown in figure 3). Then it would have been obvious to an artisan of ordinary skill in the art at the time of the invention utilize low pass filter ,as disclosed by Dent , in order to filter out the interference or noise from carrier frequency or channel and increase quality of service.

Claims 9 and 19, **Abeta teaches** the pilot signal is passed through a match filter and of a specified frequency and lower frequencies and used for channel estimation(see figure 4 , items #424 and 426). Abeta does not teach low pass filter. However, Dent teaches low pass filter (column 6, lines 11-17). Then it would have been obvious to an artisan of ordinary skill in the art at the time of the invention utilize low pass filter ,as

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disclosed by Dent , in order to filter out the interference or noise from carrier frequency or channel and increase quality of service.

Claim 10. **Abeta teaches** the received data signal is multilevel-modulated by the transmitting apparatus (see figure 3).

6. Claims 5-7 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abeta in view of Dent and further view of Ling.

Claims 5-7, **Abeta teaches** pilot and data symbols except the sampled pilot signal is interpolated into the symbol rate of said data signal using an FIR filter operating at the symbol rate of said data signal and entered into the FIR filter and pulses. However , Ling teaches the sampled pilot signal is interpolated into the symbol rate of the data signal using an FIR filter operating at the symbol rate of said data signal and entered into the FIR filter and pulses (column 7, lines 50-column 8, line 7 and figure 3 and column 10 lines 7-column 11 line 29). Then it would have been obvious to an artisan of ordinary skill in the art at the time of the invention to sample and filter out the noise signal, as disclosed by Ling, in order to estimate the interference or noise from carrier frequency or channel and increase quality of service.

Claim 14-18 Abeta and Dent do not teach a plurality of series-connected delay devices for delaying an entered pilot signal, a plurality of multipliers for multiplying the outputs of said plurality of delay devices by a plurality of predetermined coefficients, and

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an adder for adding up the outputs of said plurality of multipliers, and operates at a symbol rate of said data signal and uses the output of said adder to estimate said channel variation.

However, Ling teaches a plurality of series-connected delay devices for delaying an entered pilot signal, a plurality of multipliers for multiplying the outputs of the plurality of delay devices by a plurality of predetermined coefficients, and an adder for adding up the outputs of said plurality of multipliers, and operates at a symbol rate of said data signal and uses the output of said adder to estimate said channel variation (column 8, line 47-column 9, line 48 and figure 3). Then it would have been obvious to an artisan of ordinary skill in the art at the time of the invention delay and multiply by the coefficient, as disclosed by Ling, in order to estimate the interference or noise from carrier frequency or channel and increase quality service.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kubo et al (US 6,456,827) teaches estimating speed of a received signal from transmitter and adjust (see abstract and figure 1).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tilahun B Gesesse whose telephone number is 571-272-7879. The examiner can normally be reached on flexible schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on 571-272-7899.

The Central FAX Number is 571-273-8300. For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the Central FAX number, unless an exception applies.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

2/28/06
TILAHUNGESSE
PRIMARY EXAMINER